

Project Name: _____ **Project Number:** _____
CFLHD Project Manager: _____ **A/E or Hwy Design Mgr:** _____
Originator: _____ **Date:** _____

Capitalized text represents significant changes or additions from the 30% requirements. However, all requirements are applicable.

50% DEVELOPMENT CHECKLIST 4R Projects Only	ORIGINATOR (Initials)
Originator: "INITIAL" in block to indicate those elements completed, including incorporation of data, place an "I" in the block to indicate those elements that are incomplete, or write "N/A" to indicate those elements not applicable to the project. Resubmit the checklist as necessary until all applicable activities are complete.	
ACTIVITIES FINISHING PRIOR TO START OF THE 50% DESIGN DEVELOPMENT PHASE	
E3 activity – Environmental Compliance Approval Signing of, reproduction and circulation of EA/EDIS; public involvement (hearings) through end of official comment period. Amending and revising (finalizing) environmental document and preparing decision document.	
GENERAL	
COMMENTS FROM 30% REVIEW INCORPORATED – 30% PS&E COMMENT & RESPONSE TRACKING FORM SUBMITTED	
REVIEW/CHECK ALL ELEMENTS OF DESIGN THAT HAVE AN INFLUENCE ON THE FINAL FOOTPRINT (HORIZONTAL AND VERTICAL ALIGNMENTS, DRAINAGE STRUCTURES, RETAINING WALLS, SLOPES, EROSION CONTROL DEVICES, PARKING AREAS, MISCELLANEOUS WIDENINGS, APPROACH ROADS, ETC.)	
Documents are in compliance with established CFLHD format standards – Match agreed to format, PDDM, CADD manual, and example plans.	
ALL PHYSICAL IMPACTS TO THE WORK HAVE BEEN IDENTIFIED. FOOTPRINT IS WELL DESCRIBED (I.E. RETAINING WALL, STRUCTURES, SLOPES)	
COORDINATION OF ALL COMPETING DESIGN ELEMENTS HAVE BEEN REVISED AND OPTIMIZED.	
Current edition of standard and detail drawings used	
Sheet numbers may be hand written	
Insert design file path on all sheets (Place in lower left corner – outside of border)	
TITLE SHEET	
Correct Project Name & Number shown	
Length of Project shown	
County, State shown	
North Arrow & Graphic Scale shown	
Signature Blocks are appropriate for the funding source	
Location Map shows:	
BEGIN & END STATIONS OF PROJECT (ALL MAJOR ROADWAYS, NOT JUST MAINLINE)	
Distances to Nearest Large Destinations	
FP-XX Specification Reference shown	
Key Map of State shown with arrow to approximate project location	
Design Designations included for all major roadways (not only mainline). Including current traffic data, 20-year estimated traffic, design hourly volume, design speed , and truck percentage	
Index to Sheets	

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PMIS and Drawing Number (National Park Service Projects), State Control Numbers (State Highway Projects), and applicable client agency identification numbers	
Metric cell on projects using the International System of Units (metric)	
Plans Prepared By and Prepared For:	
CFLHD’s Project Managers and Lead Designers or Consultants name	
Noticeable stamp stating percentage complete	
CONVENTIONAL PLAN SYMBOLS AND ABBREVIATIONS	
All Symbols and Abbreviations used in the plans match sheets (latest edition).	
SITE PLAN	
Section lines, property boundaries, ownership, land marks (significant planametric features), horizontal alignment, north arrow, and graphic scale	
Previous CFLHD project boundaries and dates of construction, including projects under construction. Include all projects constructed during the previous 10 years.	
CONTROL SHEET	
SURVEY CONTROL POINT LISTING (sheet typically provided by CFLHD if mapping done by CFLHD)	
TYPICAL SECTION(S)	
THE TYPICAL SECTIONS ARE FINALIZED	
Typical Section shown for all roadways, including access and detour roads and includes the following:	
Crown	
Roadway Width(s) – Lane, shoulder, foreslope, ditch, and medians	
Edge of Traveled Way and edge of shoulder	
Cross-slopes conform to guidelines in PDDM	
Provide sufficient dimensions to construct the work	
Construction, Clearing, Topsoil, and Seeding Limits	
CONSIDER THE NEED FOR ADDITIONAL CLEARING AND GRUBBING TO GENERATE AESTHETIC VEGETATION LINES AND DISCUSS WITH THE CLIENT, SHOW AS APPROPRIATE	
INCLUDE COLUMNS IN THE TABULATION OF QUANTITIES TABLE FOR CLEARING AND GRUBBING THAT LISTS THE EXCEPTIONS TO THE STANDARD CLEARING & GRUBBING LIMITS. PROVIDE NOTE TO LINK TYPICAL SECTION WITH CLEARING & GRUBBING EXCEPTIONS IN QUANTITY TABLE.	
STATION RANGES INDICATING LOCATIONS FOR APPLICATION OF TYPICAL SECTIONS.	
Structural Section in Conformance with Geotechnical recommendations. All structural lifts shown. Future pavement, number of pavement lifts, item descriptions, prime, tack, and seal coats shown. On all typical sections show structural section and number of pavement lifts.	
Location of profile grade and hinge points shown	
Update typical sections for guardrail, paved ditches, curb, and miscellaneous typical sections necessary to define the work	
Update typical transition details between different typical section types (address width and structural section depths)	
Method of superelevation on curves (detail)	

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Curve Widening Application Table shows curve radius and corresponding widening amounts	
Cut & Fill Slope Ratio Selection Table – Matches preliminary Geotechnical Recommendations, PDDM recommendations, and used to generate cross-sections	
PROJECT LENGTH TABLE – SHOW BREAKDOWN OF PROJECT SECTIONS AND TOTAL LENGTH (DO NOT INCLUDE LENGTHS FOR MINOR APPROACH ROADS OR PARKING AREAS). SHOW BREAKOUT FOR BRIDGES, IF ANY.	
Clear Zone offset shown	
MISCELLANEOUS GRADING, CLEARING, AND GRUBBING LOCATIONS SHOWN TO ADDRESS AREAS WITH CLEAR ZONE DEFICIENCIES	
Cut slope rounding and clearing limit details shown	
Existing roadway typical section (widths, surfacing, and etc.) superimposed – dashed line. This may require a separate detail if too complicated (i.e., for clarity)	
DETERMINE THE EFFECT REMOVAL AND DISPOSAL OF EXISTING PAVEMENT MAY HAVE ON EARTHWORK QUANTITIES	
Notes – general notes providing additional information describing the work.	
SUMMARY OF QUANTITIES	
QUANTITIES FOR ALL BID ITEMS THAT AFFECT THE FOOTPRINT ARE COMPUTED (INCLUDES EARTHWORK, SURFACING QUANTITIES, BRIDGES, DRAINAGE ITEMS, RETAINING WALLS, GUARDRAIL, CURBS, REVEGETATION, ETC.) MINOR ITEMS CAN BE CALCULATED AT 70%. SHOW AN ESTIMATED QUANTITY IN BID COLUMN	
Summary also includes: Item Numbers, Item Descriptions, and Pay Units (plan & bid)	
CORRECT QUANTITIES BROUGHT FORWARD FROM TABULATION QUANTITIES SHEETS	
PLAN TOTALS MATCH SUPPORT DOCUMENTATION	
MEASUREMENT INFORMATION, DESCRIPTIVE REMARKS, AND ESTIMATING VALUES FOR PAVEMENT STRUCTURE ARE SHOWN IN “REMARKS AND/OR DETERMINATION OF ESTIMATED QUANTITIES” COLUMN.	
SHEET NUMBERS AND SHEET DESCRIPTIONS ARE CORRECT	
Insert spreadsheet file location(s) and/or file path (Place in lower left corner – outside of border)	
DRAINAGE SUMMARY	
REVISE DRAINAGE SUMMARY TO INCORPORATE PREVIOUS COMMENTS AND FOR ADVANCEMENT OF DESIGN. ALL CULVERTS ARE TO BE LISTED	
ITEM NUMBER, DESCRIPTIONS, AND PAY UNITS MATCH ESTIMATE	
CORRELATION WITH PLAN-PROFILE AND CULVERT CROSS-SECTIONS	
STATIONING, LENGTH, DIAMETER, END TREATMENTS, SURVEY AND STAKING, PERMANENT EROSION CONTROL DEVICES, AND GEOTEXTILE QUANTITIES SHOWN	
SHOW SKEW ANGLES TO THE NEAREST 5 DEGREES	
SHOW DESCRIPTOR OF DRAINAGE WORK, I.E. CULVERT STATIONING ALONG APPROACH ROAD CENTERLINE, INLET/OUTLET DITCH LENGTHS, RIPRAP TYPES, ETC. IN REMARKS COLUMN	
Insert spreadsheet file location(s) and/or file path (Place in lower left corner – outside of border)	
EARTHWORK SUMMARY	
GRADING SUMMARY AND MASS HAUL DIAGRAM REVISED	

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GRADING SUMMARY IS BROKEN DOWN INTO STATION RANGES EQUAL TO APPROXIMATELY EVERY PLAN AND PROFILE SHEET (350/700 METERS, 1000/2000 FEET) AND AT EVERY CHANGE IN SHRINK/SWELL FACTOR			
Adjustments to horizontal and vertical alignments made to achieve an overall earthwork balance. If an overall balance cannot be achieved identify borrow or waste needs.			
Earthwork summary columns in accordance with Earthwork Representation Guidelines			
LIST EARTHWORK VOLUME ADJUSTMENTS IN THE SUMMARY (SHRINK/SWELL, TOPSOIL STRIPPING, SUBEXCAVATION, BORROW, WASTE, APPROACH ROADS, CONSERVED MATERIALS, AND RETAINING WALL BACKFILL AND EXCAVATION).			
DEFINITIONS AND NOTES TO EXPLAIN ASSUMPTIONS MADE.			
Mass Haul Diagram graph			
Insert spreadsheet file location(s) and/or file path (Place in lower left corner – outside of border)			
TABULATION OF QUANTITIES			
TABULATION OF ALL BID ITEMS QUANTITIES THAT AFFECT THE FOOTPRINT (INCLUDES EARTHWORK, SURFACING QUANTITIES, BRIDGES, DRAINAGE ITEMS, RETAINING WALLS, GUARDRAIL, CURBS, REVEGETATION, TRAFFIC CONTROL, APPROACH ROADS, ETC.) NOT REQUIRED FOR MINOR BID ITEMS (I.E. SIGNING, STRIPING, TEMPORARY EROSION CONTROL ITEMS, SEEDING, ETC. (SHOW ESTIMATED QUANTITY IN BID COLUMN ONLY).			
CORRELATION WITH PLAN & PROFILE OR WORK IN INDIVIDUAL SECTION AS APPROPRIATE			
TABLES INCLUDE THE FOLLOWING:			
STATIONING, LOCATION (LEFT, RIGHT), ITEM NUMBER, DESCRIPTION, PAY UNITS, QUANTITIES WITH TOTALS, AND REMARKS AS APPROPRIATE			
HIGHWAY DESIGN STANDARDS			
PROJECT DESIGN STANDARDS UPDATED USING CFLHD AND AASHTO GUIDELINES (GREEN BOOK & ROADSIDE DESIGN GUIDE). THE FOLLOWING STANDARDS HAVE BEEN REVISED AND OPTIMIZED TO COORDINATE ALL COMPETING DESIGN ELEMENTS: DESIGN SPEED, LANE WIDTH, SHOULDER WIDTH, BRIDGE WIDTH, STRUCTURAL CAPACITY, GRADE, STOPPING SIGHT DISTANCE, CROSS SLOPE, SUPERELEVATION, HORIZONTAL AND VERTICAL CLEARANCES, CLEAR ZONE, ROADSIDE BARRIERS, END TREATMENTS, AND CURVE WIDENINGS.			
Finalize design vehicle			
ROADSIDE BARRIERS, END TREATMENT, AND CLEAR ZONE DETERMINED ACCORDING TO AASHTO ROADSIDE DESIGN GUIDE. TEMPLATE ADJUSTED TO ACCOMMODATE BARRIER PLACEMENT			
PEDESTRIAN AND BICYCLE SAFETY: SEPARATION BETWEEN TRAVEL WAY AND BICYCLE/PEDESTRIAN FACILITIES, WIDTH OF FACILITY, AND VERTICAL CLEARANCE UPDATED.			
Rollover is less than or equal to 8% between traveled way and shoulder (pullouts, adjacent parking areas, parking lanes, passing lanes, etc.)			
GEOMETRY			
<u>Horizontal Alignment</u>			
REVIEW THE GEOMETRY DESIGN ELEMENTS LISTED IN THE 30% DEVELOPMENT CHECKLIST AND ENSURE THAT REVISIONS MADE TO THE PLANS ALSO INCORPORATE REVISIONS TO THOSE ELEMENTS			
HORIZONTAL ALIGNMENT IS OPTIMIZED PENDING 50% REVIEW			
<u>Vertical Alignment</u>			
REVIEW THE GEOMETRY DESIGN ELEMENTS LISTED IN THE 30% DEVELOPMENT CHECKLIST AND ENSURE THAT REVISIONS MADE TO THE PLANS ALSO INCORPORATE REVISIONS TO THOSE ELEMENTS			

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VERTICAL ALIGNMENT IS OPTIMIZED PENDING 50% REVIEW COMMENTS.	
<u>Horizontal and Vertical Alignment Relationships</u>	
REVIEW THE GEOMETRY DESIGN ELEMENTS LISTED IN THE 30% DEVELOPMENT CHECKLIST AND ENSURE THAT REVISIONS MADE TO THE PLANS ALSO INCORPORATE REVISIONS TO THOSE ELEMENTS	
<u>Superelevation</u>	
REVIEW THE GEOMETRY DESIGN ELEMENTS LISTED IN THE 30% DEVELOPMENT CHECKLIST AND ENSURE THAT REVISIONS MADE TO THE PLANS ALSO INCORPORATE REVISIONS TO THOSE ELEMENTS	
<u>Intersections</u>	
SUFFICIENT LENGTHS FOR ACCELERATION AND DECELERATION LANES ARE INCORPORATED	
SUFFICIENT STORAGE FOR SPEED-CHANGE AND TURNING LANES PROVIDED	
PLAN AND PROFILE	
<u>Plan</u>	
PLAN UPDATED TO INCLUDE ALL COMMENTS AND OBSERVATIONS FROM THE 30% FIELD REVIEW	
PLANS ARE ANNOTATED WITH APPROPRIATE NOTES DESCRIBING IDENTIFIED CONSTRUCTION CONSIDERATIONS, CULVERT INFORMATION, AND LOCATIONS OF PAVED DITCHES, GUARDRAIL, SUBEXCAVATION, RIGHT-OF-WAY, AND ETC.	
Information shown is clear and concise. Symbology is not cluttered.	
Beginning and end of proposed construction shown	
Identified and referenced to profile with arrow	
Stations of terminus points shown	
North Arrow shown on each sheet	
Township, Range, and Section No.’s shown	
PROPERTY BOUNDARIES AND OWNERSHIP (NAMES) SHOWN	
Revised Horizontal Alignment	
Curve Data – curve name, PI station, delta(s), radius, tangent length, curve length, and superelevation shown for each curve. Include spiral data as appropriate	
BEARINGS/AZIMUTHS ARE SHOWN ALONG TANGENTS	
Edge of Existing Roadway Shown	
Limits of Disturbance shown (includes, Cut & Fill Slope Stake, Rounding, & Clearing, Drainage Structures, Approach Roads, and Temporary traffic diversions)	
PRELIMINARY RIGHT-OF-WAY LIMITS SHOWN, INCLUDING PROPOSED EASEMENTS (TEMPORARY CONSTRUCTION, MAINTENANCE, DRAINAGE, ETC.)	
Control Points – Point number and symbology (elevations not shown)	
New and Existing Culverts	
ALL NEW CULVERTS SHOWN, NATURAL DRAINAGE AREAS AND DITCH RELIEF.	
Identify boundaries of historic, cultural, and natural resources that require protection or special treatment. Add note to plans stating that references to historic, cultural, and natural resources will be removed from the plans at the 70% submittal and replaced with construction notes for the protection of site.	
Planimetric features	
Existing Creeks and Rivers w/Correct Names	

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Symbols used match standard symbol sheet. New symbols are shown in a legend			
Pullout/Parking Area			
SHOW SHAPE AND LOCATION, INCLUDING LIMITS OF DISTURBANCE			
DEVELOP SPECIAL DRAWING SHEETS TO SHOW DETAILS			
Road Approaches			
REFINED HORIZONTAL ALIGNMENT FOR PUBLIC INTERSECTION ROADS, WITH APPROPRIATE TYPE AND CLASS, AND LIMITS OF DISTURBANCE			
STANDARD ROADWAY CONNECTION SYMBOL WITH TYPE, CLASS, MAINLINE STATIONING, AND DESIGN GRADE SHOWN FOR MINOR APPROACH ROADS			
REVISED GUARDRAIL LOCATIONS SHOWN WITH SYMBOL			
REVISED RETAINING WALL LOCATIONS SHOWN WITH SYMBOL			
Existing Utilities (power, phone, & buildings). Show all known utilities			
FENCES TO BE CONSTRUCTED OR RELOCATED (SHOWN ON PLAN & PROFILE SHEETS ONLY WHEN WORK IS CLEAR AND NOT CLUTTERED). USE SEPARATE DETAIL SHEETS WHEN SYMBOLS, NOTES, STATIONS, ETC. IS NOT CLEAR OR CLUTTERED.			
FENCES AND GATES – SHOW BEGIN/END STATIONS, TIE WITH EXISTING FENCES, OFFSETS FROM CENTERLINE, CATTLEGUARDS, STATIONING AT CHANGES OF DIRECTION, ETC.			
FENCE SYMBOLOGY – SHOW CATTLEGUARDS, FENCE AND GATE TYPES			
ROADWAY OBLITERATION (MAY BE SHOWN ON EROSION CONTROL OR OTHER APPROPRIATE SHEET, IF SHEET IS CLUTTERED).			
Index contour lines show elevations (elevations are readable)			
Place the note: "The alignment and grade as shown hereon are subject to adjustment"			
<u>Profile</u>			
PROFILE UPDATED TO INCLUDE ALL COMMENTS AND OBSERVATIONS FROM THE 30% FIELD REVIEW			
REVISED VERTICAL ALIGNMENT – RECHECK ALL ITEMS BELOW WHERE CHANGES OCCURRED			
Existing ground line shown and labeled			
Proposed profile grade shown and labeled – maximum gradient not exceeded.			
Length of Vertical Curves, K-Values, and Stopping Sight Distance shown			
Grid elevations			
Profile grade agrees with Typical Section grade point location			
VPI's Stations and Elevations			
BEGINNING AND END OF WORK, STATIONS AND ELEVATIONS SHOWN			
Culvert locations agree with plan sheets and drainage summary			
Culvert symbol(s) shown			
TEXT SHOWS STATION, CULVERT DIAMETER AND LENGTH, NUMBER OF BARRELS, END TREATMENT, AND PERMANENT EROSION CONTROL DEVICES			
Correct culvert symbol and scale is used			
Hydraulic Information for Large Culverts, 1200mm (48") and above (design flow, drainage basin area, etc.)			
Show revised retaining wall face outline and total wall face area quantity			
Show revised structure layout shape			

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Show low water crossings	
HYDRAULICS	
Incorporate intermediate hydraulic recommendations	
Revise standard, detail, and/or special drainage plan sheets	
PAVEMENTS	
V2 ACTIVITY – PAVEMENT REPORT COMPILE AND EVALUATE INFORMATION FROM V1. PREPARE A DRAFT PAVEMENT REPORT. <i>THIS ACTIVITY WILL CONTINUE THROUGH THE 70% DESIGN DEVELOPMENT PHASE.</i>	
GUARDRAIL	
GUARDRAIL TYPICAL SECTION SHOWN. PROPER SHY LINE DISTANCE BEING USED. SHOULDER WIDENING INCLUDES REQUIRED DISTANCES FROM BACK OF POSTS TO HINGE POINT. IF MAJORITY OF POSTS NEED TO BE LENGTHENED, POST DETAIL CHANGED AND SPECIAL CONTRACT REQUIREMENTS AMENDED.	
TERMINAL SECTION CHOSEN IS APPROVED BY THE MAINTAINING AGENCY	
BARRIER SELECTION CONSIDERED DISTANCE TO FIXED OBJECTS AND BARRIER DEFLECTION	
ROADSIDE BARRIERS DESIGNED ACCORDING TO AASHTO ROADSIDE DESIGN GUIDE AND NCHRP 350, INCLUDING PROPER FLARE RATES AND OFFSETS TO TERMINAL ENDS	
ENVIRONMENT	
ENVIRONMENTAL DOCUMENTS ARE ONCE AGAIN REVIEWED AND THE MITIGATION MEASURES AND COMMITMENTS FOR THE PROJECT ARE INCORPORATED INTO THE DESIGN. SUPPORT THE ENVIRONMENTAL PROCESS AS NECESSARY	
Environmental comments from previous reviews are incorporated.	
TEMPORARY TRAFFIC CONTROL	
PRELIMINARY TEMPORARY TRAFFIC CONTROL DESIGN DEVELOPED, INCLUDING DETOURS, PHASING, ETC. TO CONSTRUCT THE PROJECT (I.E. RETAINING WALL AND STRUCTURE CONSTRUCTION).	
HAULING AND DETOUR ROUTES DISCUSSED WITH CLIENT/MAINTAINING AGENCY AND PRIVATE LANDOWNERS, AS APPROPRIATE, REQUIREMENTS AND/OR RESTRICTIONS INCORPORATED.	
LAYOUT DETAILS FOR DETOURS DEVELOPED, INCLUDING SLOPES, DRAINAGE STRUCTURES, ETC. ALL ELEMENTS OF DESIGN AFFECTING THE FINAL FOOTPRINT ARE DEVELOPED.	
ROAD CLOSURES DISCUSSED WITH CLIENT AGENCY TO ALLOW FOR CONSTRUCTION OPERATIONS.	
CONSTRUCTION ACCESS TO STRUCTURES DEVELOPED SUFFICIENTLY TO DETERMINE FINAL FOOTPRINT.	
SPEED THROUGH CONSTRUCTION ZONE CONSIDERED. REGULATORY SPEED REDUCTIONS COORDINATED WITH THE CLIENT.	
INTERMEDIATE OPENINGS IN TEMPORARY CONCRETE BARRIERS FOR ACCESS TO RESIDENCES, BUSINESSES, OR FOR CONSTRUCTION EQUIPMENT ARE DETERMINED.	
TEMPORARY PAVEMENT STRUCTURE COORDINATED WITH GEOTECH, TAKING BOTH TRAVELING PUBLIC AND CONSTRUCTION VEHICLES INTO ACCOUNT.	
MINIMUM LANE WIDTHS DETERMINED FOR VEHICLE TYPES USING ROADWAY.	
GRADE CHANGES TAKEN INTO CONSIDERATION FOR STAGE CONSTRUCTION OF ADJACENT LANES.	
SUFFICIENT STAGING AREA SPACE FOR THE CONTRACTOR TO ACCOMPLISH NECESSARY OPERATIONS.	

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TEMPORARY TRAFFIC CONTROL DETAILS AND PROJECT SPECIFIC TEMPORARY TRAFFIC CONTROL DRAWINGS INCLUDE:			
PROJECT TERMINI SIGNING			
PART WIDTH CONSTRUCTION SIGNING			
TYPICAL SIGN LOCATIONS			
NOTES			
PERMANENT SIGNING			
FHWA SIGNING STANDARD AND CFLHD DETAIL SHEETS INCLUDED			
PRELIMINARY SIGNING LAYOUT PLAN			
PERMANENT PAVEMENT MARKINGS			
FHWA PAVEMENT MARKING STANDARDS AND CFLHD DETAIL SHEETS INCLUDED.			
PRELIMINARY PAVEMENT MARKING LAYOUT PLAN			
ROAD APPROACHES			
FINAL HORIZONTAL AND VERTICAL ALIGNMENTS DEVELOPED FOR PUBLIC INTERSECTION APPROACH ROADS			
FINALIZE LOCATION OF MINOR APPROACH ROADS. STANDARD ROADWAY CONNECTION SYMBOL WITH TYPE, CLASS, MAINLINE STATIONING, AND DESIGN GRADE SHOWN FOR MINOR APPROACH ROADS			
APPROACH ROAD PROFILES AND RADIUSSES DESIGNED ACCORDING TO THE STANDARD CONNECTION ROAD DETAILS.			
INTERSECTIONS AT 90°, WHERE POSSIBLE.			
STEEP GRADES MINIMIZED AND A SUFFICIENT LANDING PROVIDED AT ROADWAY EDGE. LANDINGS PROVIDED FOR GRADES STEEPER THAN 3% WHERE PRACTICAL.			
TYPICAL SECTION(S) PROVIDED			
LIMITS OF DISTURBANCE SHOWN FOR ALL APPROACH ROADS			
PARKING AREAS			
LAYOUT DETAILS FOR PARKING AREA(S) DEVELOPED, INCLUDING SLOPES, STALLS, ETC. ALL ELEMENTS OF DESIGN AFFECTING THE FINAL FOOTPRINT ARE DEVELOPED. NUMBER OF HANDICAP STALLS APPROPRIATE FOR TOTAL NUMBER OF PARKING AREA STALLS.			
PARKING AREA PLANS CHECKED FOR SUFFICIENT TURNING AND BACK-UP MOVEMENT WIDTHS. SUFFICIENT STALL AND ISLE WIDTHS.			
MEETS AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS			
EROSION CONTROL			
PRELIMINARY EROSION CONTROL PLAN LAYOUT SHEETS DEVELOPED SHOWING TEMPORARY AND PERMANENT EROSION CONTROL DEVICES. DEVELOP EROSION CONTROL DEVICES IN SUFFICIENT DETAIL TO IDENTIFY ALL IMPACTS TO THE FINAL FOOTPRINT.			
EFFECTIVENESS, USE OF BEST MANAGEMENT PRACTICES.			
Incorporate CFLHD erosion control detail sheets showing the typical materials, installation, and dimensions of the erosion control devices proposed. Identify additional erosion control detail sheets and continue development.			

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PRELIMINARY SEDIMENT BASINS DESIGNED, INCLUDING COMPUTATIONS ON THE SIZE REQUIREMENTS FOR THE BASINS.			
MAJOR STRUCTURES			
PRELIMINARY RETAINING WALL LAYOUT SHEETS DEVELOPED IN SUFFICIENT DETAIL TO IDENTIFY ALL IMPACT TO THE FINAL FOOTPRINT.			
LAYOUT SHEETS FOR LARGE CULVERTS (I.E. REQUIRE HEADWALL, SPECIAL DETAILS) ARE DEVELOPED IN DETAIL TO IDENTIFY ALL IMPACT TO FINAL FOOTPRINT.			
Update temporary shoring to accommodate traffic and facilitate construction			
Bridge			
B2-2 activity – Structural Layout (cont'd)			
PROVIDE STRUCTURAL PRELIMINARY LAYOUT (TS&L) FOR APPROVED ALTERNATIVE			
OTHER STRUCTURAL INFORMATION			
B2 ACTIVITY IS COMPLETED IN CONJUNCTION WITH HYDRAULICS AND GEOTECHNICAL ACTIVITIES.			
THE STRUCTURAL LOCATION, LENGTH, GRADE AND WATERWAY OPENING ARE NEEDED BY HYDRAULICS BEFORE THEY CAN PERFORM THE FINAL ANALYSIS.			
IF AVAILABLE, THE MOST RECENT HYDRAULIC INFORMATION SHOULD BE INCLUDED ON THE STRUCTURAL LAYOUT BEFORE IT IS DISTRIBUTED.			
THE SUBSTRUCTURE LOCATIONS ARE NEEDED BY GEOTECHNICAL BEFORE THEY CAN PERFORM THEIR DRILLING.			
IF GEOTECHNICAL IS ABLE TO RECOMMEND A CERTAIN TYPE OF FOUNDATION, IT SHOULD BE INDICATED ON THE STRUCTURAL LAYOUT.			
FINAL BRIDGE TS&L, PENDING FINAL HORIZONTAL AND VERTICAL ALIGNMENT APPROVAL			
UTILITIES			
LOCATIONS OF ALL KNOWN EXISTING AND PROPOSED UTILITIES SHOWN ON PLAN VIEW AND DETAIL SHEETS			
PLANS REFLECT ALL UTILITY CONFLICTS (EXISTING AND PROPOSED)			
UNDERGROUND UTILITY SURVEY COMPLETED, IF NECESSARY. TEST BORINGS TAKEN			
HEIGHT CLEARANCE FOR OVERHEAD UTILITIES FIELD CHECKED			
U2 activity – Utility Accommodation, Relocation and Certification			
DEVELOP A UTILITY ACCOMMODATION/RELOCATION PLAN. <i>THIS ACTIVITY WILL CONTINUE THROUGH THE 95% DESIGN DEVELOPMENT PHASE</i>			
STANDARD DRAWINGS			
Applicable FLH Standard Drawings included, current version			
Applicable CFLHD Detail Drawings included, current version			
MISCELLANEOUS DESIGN ELEMENTS			
INCLUDE IN THE PLAN SET, DETAILS AND SPECIALS NOT DISCUSSED IN OTHER SECTIONS THAT REFLECT THE PROJECT WORK. THESE MAY INCLUDE SIDEWALKS, OBLITERATION, BENCHING, CURBS, DROP INLETS, AND ETC.			

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ROADWAY CROSS-SECTIONS	
CUT AND FILL SLOPES REVISED IN ACCORDANCE WITH THE GEOTECHNICAL MEMORANDUM, ADJUSTED TO BEST FIT THE TOPOGRAPHY, MINIMIZE ENVIRONMENTAL AND VISUAL IMPACTS, AND MINIMIZE OVERALL CONSTRUCTION COSTS.	
Cross-sections match Typical Section and Cut & Fill Slope Ratio selection table	
Final cross-section locations are included for intermediate stations at all changes in subgrade width (i.e. guardrail terminal locations, culvert inlets, curve widening, pullouts, etc.). Locate changes in template width on 10 or 20 meter (25’ or 50’) stations where possible. Provide cross-sections on 10 meter (25’) intervals through retaining walls and on centerline curves with a radius of 75 meters (250’) or less. Cross-sections reflect the stations to be reference hubbed. Delete all extraneous cross-sections.	
DITCH WIDENING AT CULVERT INLETS INCORPORATED, INCLUDING WIDTH TRANSITIONS	
WIDEN DITCHES AT END OF CUTS – TRANSITION FROM CUT TO FILL (I.E. FLARE DITCH AND FLATTEN CUTSLOPE) INCORPORATED. SEE SECTION 9.4 OF THE PDDM.	
Existing ground	
Proposed cross-section showing all structural section layers	
Curve widening, paved ditches, curbs, retaining walls, guardrail, etc. is incorporated	
Slope ratios for all slopes outside of subgrade shoulder	
Superelevation rates (m/m or ft/ft) between subgrade shoulders	
Station, design grade, subgrade, and original ground elevations	
Centerline symbol	
Horizontal location of existing and proposed Right-of-Way limits	
Horizontal and vertical location of utilities	
Guardrail symbol	
Retaining wall shape	
Grid elevations and offset distances	
CULVERT CROSS-SECTIONS	
Cross-sections match Typical Section and Cut & Fill Slope Ratio selection table	
Cross-sections show end treatment, including riprap and inlet and outlet ditches	
Culvert is located to match the natural stream gradient and proper cover is achieved	
Culverts station and skew agree with plan and profile sheet	
TEXT SHOWS STATION, CULVERT DIAMETER AND LENGTH, NUMBER OF BARRELS, AND CULVERT SLOPE	
Culvert is drawn proportional to grid	
Existing ground	
Proposed cross-section (drawn along alignment of culvert)	
Slope ratios shown for all slopes outside of subgrade shoulder	
Superelevation rates (m/m or ft/ft) between subgrade shoulders	
Horizontal location of existing and proposed Right-of-Way limits shown	
Horizontal and vertical location of utilities shown	
Show guardrail, retaining walls, and paved ditches symbols/shapes	
Grid elevations and offset distances	

50% DEVELOPMENT CHECKLIST		4R Projects Only	ORIGINATOR (Initials)
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RIGHT-OF-WAY			
SEE POST 50% SUBMITTAL SECTION FOR REQUIREMENTS			
SPECIFICATIONS			
DEVELOP DRAFT SPECIFICATIONS FOR ALL ITEMS OF WORK. INCLUDE ALL APPROPRIATE UP-TO-DATE SPECIFICATIONS FROM THE LIBRARY OF SPECIFICATIONS.			
INCLUDE SPECIFICATIONS FOR LIMITS ON CONSTRUCTION OPERATIONS, INCLUDING DATES AND ENVIRONMENTAL COMMITMENTS			
PROJECT SPECIFIC SCRs ARE HIGHLIGHTED OR REDLINED IN COPIES DISTRIBUTED FOR FHWA REVIEW. CLEAN COPIES (NO REDLINE OR HIGHLIGHT) PROVIDED FOR EXTERNAL DISTRIBUTION			
INCORPORATE RECOMMENDATIONS FROM GEOTECH, HYDRAULICS, BRIDGE, MATERIALS, SAFETY, AND PARTNER AGENCIES			
INCORPORATE COMMENTS FROM PREVIOUS REVIEWS, COMMUNICATION, ETC.			
PLANS CONTAIN THE FOLLOWING SHEETS			
Title sheet			
Conventional plan symbols and abbreviations			
SURVEY CONTROL POINT LISTING			
Site map			
Typical sections			
Miscellaneous typical section details			
Summary of Quantities sheets			
TABULATION OF QUANTITIES SHEETS			
Drainage Summary			
Grading summary and mass haul diagram			
Mainline plan and profile sheets			
Designed public intersection approach road plan and profile			
BRIDGE TS&L			
PARKING AREA PLAN AND DETAIL SHEETS, SHOWING FINAL LAYOUT			
CFLHD Soil Erosion Control Details (i.e. Silt fence, sediment logs, etc.)			
EROSION CONTROL LAYOUT PLAN SHEETS			
Road connections details			
Embankment benching details and specials			
Placed riprap details			
CFLHD MSE RETAINING WALL DETAILS			
RETAINING WALL LAYOUT SHEETS			
BOX CULVERT LAYOUT SHEETS OR OTHER LARGE CULVERTS NEEDING HEADWALLS OR SPECIAL DETAILS			
CONCRETE HEADWALL DETAILS			
Pipe culvert standard plans			
Drop inlet specials			
Underdrain details			

50% DEVELOPMENT CHECKLIST <div style="text-align: right;">4R Projects Only</div> <p>Originator: “INITIAL” in block to indicate those elements completed, including incorporation of data, place an “I” in the block to indicate those elements that are incomplete, or write “N/A” to indicate those elements not applicable to the project. Resubmit the checklist as necessary until all applicable activities are complete.</p>	ORIGINATOR (Initials)
SPILLWAY AND PIPE ANCHOR TYPICAL DETAILS	
Paved ditch details	
Guardrail standard drawings	
MASONRY SPECIALS	
Fence and gate details	
Cattleguard details	
Widening for cattleguard and gate	
REVEGETATION / LANDSCAPING PLANS AND DETAILS (TYPICAL DETAILS AND INITIAL LAYOUTS)	
PROJECT SPECIFIC SIGNING AND STRIPING PLANS (TYPICAL DETAILS AND INITIAL LAYOUTS)	
CFLHD SIGNING AND STRIPING TYPICAL DETAILS	
CFLHD Temporary Traffic control details, drawings, and project specific drawings	
CROSS-SECTIONS PLAN SET COVER SHEET, IF NECESSARY	
Mainline cross-sections	
Public intersection road cross-sections	
Culvert pipe cross-sections	
ESTIMATE	
50% COST ESTIMATE	
ESTIMATE TO INCLUDE ALL PAY ITEMS, INCLUDING: EARTHWORK, SURFACING QUANTITIES, DRAINAGE ITEMS, RETAINING WALLS, GUARDRAIL, CURBS, REVEGETATION, ETC. ALL BID ITEMS AFFECTING THE FOOTPRINT HAVE TABULATIONS AND MINOR BID ITEMS ARE ESTIMATED.	
UPDATE PRELIMINARY COST ESTIMATE FOR BRIDGE ON SQUARE AREA BASIS	
CONTINGENCY IS INCLUDED IN BID ITEM ROUNDUPS, PER PROJECT DEVELOPMENT AND DESIGN MANUAL (PDDM).	
DISTINGUISH MATERIAL QUALITY AND SMOOTHNESS INCENTIVES (USE FP AND SCRS FOR COMPUTATION OF INCENTIVES, ENGINEER’S ESTIMATE DOES NOT COMPUTE THEM CORRECTLY)	
DISTINGUISH CONTRACT QUANTITY BID ITEMS	
DBE/WBE INCENTIVE NOT INCLUDED IN ESTIMATE	
UNIT PRICE ANALYSIS FOR ALL PAY ITEMS	
Cost estimate may be provided in a spreadsheet format or Engineer’s Estimate program	
Verify that the estimate is within the programmed amount	
PERMITS	
DRAFT PERMIT APPLICATION, DRAWINGS, FORMS, AND DATA DEVELOPED (I.E. 404 AND STATE 401 PERMIT APPLICATIONS)	
IDENTIFY AND RESEARCH THE NEED FOR PERMITS	
WORK WITH THE REGULATORY AGENCY, AS NEEDED, FOR PRE-APPLICATION GUIDANCE	
HIGHWAY DESIGN STANDARDS FORM (HDS)	
REVISE HDS, INCLUDE ALL DESIGN EXCEPTION AREAS, JUSTIFICATION FOR THE EXCEPTIONS, AND MITIGATIONS USED.	

50% DEVELOPMENT CHECKLIST		4R Projects Only	ORIGINATOR (Initials)
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ALL REMAINING DESIGN EXCEPTIONS HAVE BEEN IDENTIFIED, EVALUATED AND MITIGATED.			
DELIVERABLES			
50% PLANS			
50% SPECIFICATIONS			
50% COST ESTIMATE			
REVISED UNIT PRICE ANALYSIS FOR ALL BID ITEMS			
EARTHWORK REPORT (GEOPAK GENERATED REPORT)			
INTERIM FIELD INVESTIGATION AND LABORATORY RESULTS MEMORANDUMS			
DRAFT PAVEMENTS REPORT			
STRUCTURAL PRELIMINARY LAYOUT (TS&L) TO BE SUBMITTED WITH 50% DELIVERABLES, APPROVAL OF TS&L SUBJECT TO FINAL HORIZONTAL AND VERTICAL ADJUSTMENTS.			
STRUCTURAL DESIGN CRITERIA (SUBMITTED BETWEEN THE 50% AND 70% REVIEWS)			
REVISED HIGHWAY DESIGN STANDARDS FORM			
DRAFT PERMIT APPLICATION FORMS AND DRAWING			
FINAL INTERACTIVE HIGHWAY SAFETY DESIGN MODEL REPORT, INCLUDING UPDATED NARRATIVE EXPLAINING RESULTS			
DRAFT CONSTRUCTION SCHEDULE (CPM), INCLUDING UPDATES			
UPDATED DESIGN TECHNICAL MEMORANDUM			
ELECTRONIC FILES WITH HORIZONTAL AND VERTICAL ALIGNMENTS, CUT/FILL LIMITS, CULVERTS, RIGHT-OF-WAY, CURVE DATA, EXISTING GROUND PROFILE ON CENTERLINE, AND CROSS-SECTIONS			
FINAL BOUNDARY COMPILATION			
RIGHT-OF-WAY QA/QC CHECKLIST			
QA/QC CERTIFICATION OF COMPLIANCE			
30% COMMENT AND RESPONSE TRACKING FORM			
50% PS&E DEVELOPMENT CHECKLIST			
FIELD REVIEW			
SC50 activity - Alignment Staking For 50% Field Review			
Alignment staked on 100 foot (40 meter) stations for tangents and 50 foot (20 meters) for curves. As a minimum stake the beginning, end, and center point on short curves. Limits of staked alignment are as needed.			
Topography is checked by visual observation, hand level, and cloth tape by designer at critical locations to confirm aerial topography			
Prepare agenda for field review			
Prepare a list of discussion topics for the field review			
REVIEW THE DESIGN AT ALL PROPOSED NATURAL DRAINAGES AND DITCH RELIEF CULVERT LOCATIONS			
REVIEW ALL IMPACTS TO THE FINAL FOOTPRINT			
Review intersections, mailbox areas, wall areas, etc.			
Produce a master relined plan set with field review comments for inclusion in the 70% design			
Prepare trip report			

50% DEVELOPMENT CHECKLIST <div style="text-align: right;">4R Projects Only</div> <p>Originator: “INITIAL” in block to indicate those elements completed, including incorporation of data, place an “I” in the block to indicate those elements that are incomplete, or write “N/A” to indicate those elements not applicable to the project. Resubmit the checklist as necessary until all applicable activities are complete.</p>	ORIGINATOR (Initials)
POST 50% ACTIVITIES <i>Activities to be conducted between the 50 and 70 percent reviews so data can be incorporated into the 70% PS&E package.</i>	
REVISE THE HORIZONTAL AND VERTICAL ALIGNMENTS AND ALL OTHER ELEMENTS OF THE WORK THAT AFFECT THE FINAL FOOTPRINT; UPDATE THE FOOTPRINT IMPACT; AND SUBMIT THE PLAN & PROFILE SHEETS AND CROSS-SECTIONS FOR REVIEW AND APPROVAL PRIOR TO FINALIZING THE RIGHT-OF-WAY PLANS	
B3-STRUCTURAL DESIGN AND CHECK	
FINAL TS&L (CLIENT APPROVAL)	
PROVIDE FINAL TS&L TO HYDRAULICS AND GEOTECHNICAL FOR FINAL INVESTIGATIONS	
B3-1 STRUCTURAL SITE VISIT (OPTIONAL)	
PERFORM STRUCTURAL SITE VISIT TO REVIEW PROPOSED BRIDGE TS&L	
B3-2 STRUCTURAL DESIGN CRITERIA	
PROVIDE SUMMARY OF PRELIMINARY STRUCTURAL DESIGN CRITERIA	
THE STRUCTURAL LAYOUT, FINAL ROADWAY HORIZONTAL ALIGNMENT, AND PROFILE GRADE ARE REQUIRED TO BE COMPLETED AND FINALIZED PRIOR TO INITIATING THIS ACTIVITY	
THE FINAL HYDRAULIC RECOMMENDATIONS, INCLUDING THE SCOUR ESTIMATE AND COUNTERMEASURES, AND THE FINAL GEOTECHNICAL RECOMMENDATIONS ARE REQUIRED PRIOR TO BEGINNING THE SUBSTRUCTURE DESIGN	
G2 activity – Geotechnical Investigation Earthwork, bridge foundations, retaining wall, landslide, and material source investigations <i>This activity began during the POST 15% activities</i>	
G3 activity – Geotechnical Recommendations CONDUCT GEOTECHNICAL ANALYSIS AND PREPARE REPORT WITH FINAL GEOTECHNICAL RECOMMENDATIONS FOR EARTHWORK, BRIDGE FOUNDATIONS, RETAINING WALLS, LANDSLIDES, AND MATERIAL SOURCES	
H3 ACTIVITY – FINAL HYDRAULIC RECOMMENDATIONS FINALIZE THE ROADWAY, BRIDGE AND SPECIAL FEATURES ANALYSIS AND PREPARE THE FINAL HYDRAULICS REPORT DOCUMENT	
R3 ACTIVITY – FINAL RIGHT-OF-WAY PLANS PRODUCING ALL DOCUMENTS NEEDED FOR RIGHT OF WAY, AND UTILITIES. <i>TO BE SUBMITTED AFTER ALIGNMENT AND FOOTPRINT IMPACTS IDENTIFIED DURING THE 50% PS&E REVIEW ARE INCORPORATED AND APPROVED, BUT NO LATER THAN THE 70% PS&E SUBMITTAL, UNLESS APPROVAL IS GRANTED.</i>	
S4 ACTIVITY – REFERENCE HUB/SUPPLEMENTAL CONTROL SURVEY (TERRAIN VERIFICATION) CROSS SECTIONS AND REFERENCE HUBS. THIS ACTIVITY MAY BE ACCOMPLISHED IN THREE WAYS DEPENDING ON THE NEEDS OF THE PROJECT AND BUDGETARY CONSIDERATIONS. <ul style="list-style-type: none"> • A TOPOGRAPHIC SURVEY MAY BE PERFORMED THAT WOULD FOLLOW THE SPECIFICATIONS FOR A GROUND SURVEY. • ACTUAL GROUND CROSS-SECTIONS ARE MEASURED AT THE LOCATION REQUIRED BY THE NEEDS OF THE DESIGN & CFLHD SPECIFICATIONS. • ACTUAL GROUND CROSS-SECTIONS ARE MEASURED AND SLOPE STAKES AND REFERENCES SET 	
REVEGETATION NEEDS	
DETERMINE SEED, PLANT, AND FERTILIZER TYPES FOR WORK AREAS DISTURBED BY THE PROJECT, INCLUDING WASTE, BORROW, AND ROADWAY OBLITERATION AREAS.	
DRAFT SEED MIXTURES DETERMINED	
SEED PRODUCERS CONTACTED TO DETERMINE AVAILABILITY.	
SEEDING SEASONS, FERTILIZER REQUIREMENTS, METHOD OF SEEDING, APPLICATION RATES, MULCH TYPE, ETC. DETERMINED BASED ON DISCUSSIONS WITH CLIENT OR MAINTAINING AGENCY AND PRODUCT SUPPLIERS.	

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DRAFT PLANTING STOCK DETERMINED	
NURSERIES CONTACTED TO DETERMINE AVAILABILITY.	
PLANTING SEASONS, FERTILIZER REQUIREMENTS, METHOD OF PLANTING, WATER REQUIREMENTS, STAKING, BACKFILL, AND ETC. DETERMINED BASED ON DISCUSSIONS WITH CLIENT OR MAINTAINING AGENCY AND PRODUCT SUPPLIERS.	
TREES (EXISTING OR PROPOSED) NOT ENCROACHING INTO CLEAR ZONE.	